

**TRANSLATION****PATENT COOPERATION TREATY****PCT****INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>AY05-0129WO1</b>	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. <b>PCT/JP2005/001488</b>	International filing date (day/month/year) <b>02.02.2005</b>	Priority date (day/month/year) <b>01.03.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>C22C5/04, C23C14/34, C25C5/02</b>		
Applicant <b>NIPPON MINING &amp; METALS CO., LTD.</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>3</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report																								
Name and mailing address of the IPEA/IP	Authorized officer																								
Facsimile No.	Telephone No.																								

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-10 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 3-5, 7 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 2, 9 \_\_\_\_\_ received by this Authority on 22.08.2005
- nos.\* 1 \_\_\_\_\_ received by this Authority on 08.03.2006
- ☐ the drawings:
- sheets \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 6 \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 8, 10-17 \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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## Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 9

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 9  
are so unclear that no meaningful opinion could be formed (*specify*):

Claim 9 is unclear in as much as the disclosure therein cites claim 6, which was deleted by the most recent amendments; therefore, it is impossible to express a meaningful opinion in relation to claim 9.

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. \_\_\_\_\_

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	7	YES
	Claims	1-5	NO
Inventive step (IS)	Claims	7	YES
	Claims	1-5	NO
Industrial applicability (IA)	Claims	1-5, 7	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Document 1: JP 2001-20065 A (Hitachi Metals, Ltd.), 23 January 2001, claims, and paragraphs [0001], [0019], [0023], [0030], [0031], [0038], [0040], [0044] and [0045]

Document 2: JP 2000-178721 A (Mitsubishi Materials Corp.), 27 June 2000, paragraphs [0002] to [0005]

Document 3: JP 2002-167668 A (Toshiba Corp.), 11 June 2002, paragraphs [0006] to [0008]

Document 4: JP 2002-105631 A (Sumitomo Metal Mining Co., Ltd.), 10 April 2002, claims

Claims 1 to 5 lack novelty and do not involve an inventive step in the light of document 1 cited in the international search report.

With regards to the Ru sputtering target, which can be used in the production of semiconductors, and the Ru powder, which serves as the starting material for said sputtering target, document 1 teaches that it is possible to produce a Ru target that has a high level of purity, a low oxygen content, a high density and a uniform microstructure; teaches that it is possible to produce a uniform high-purity Ru thin film; teaches a Ru starting

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

material powder and an Ru powder that include 10 ppm by weight or less of an alkali metal element, 5 to 50 ppm by weight or less of Al, a total of 100 ppm by weight or less of transition metal elements, and 10 ppb by weight or less of each radioactive element (refer to the comparative examples and sample 4); and teaches that sample 4 has an oxygen content of 100 ppm by weight or less and a purity, excluding gas components, of 99.99% or higher.

Furthermore, the scope of the high-purity Ru alloy powder set forth in claims 1 to 5 cannot be said to exclude powders with a purity of 99.95%.

Claim 7 is novel and involves an inventive step.

The method for the production of high-purity Ru powders that is set forth in claim 7, wherein a Ru starting material with a purity of 3N or lower is used as an anode and is refined by means of electrolysis within a solution, is not disclosed in any of documents 1 to 4 cited in the international search report, and would not have been obvious to a person skilled in the art.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box I.4

The "high-purity Ru sputtering target characterized in that the content of each alkali metal element such as Na and/or K is 10 ppm by weight or less and the content of Al is in a range of 5 to 50 ppm by weight," which is set forth in newly added claim 8, goes beyond the scope of the disclosures in the present application as originally filed.

As originally filed, the present application only claims the sputtering targets set forth in claims 1 to 5, which are obtained by sintering a high-purity Ru powder, and does not claim the invention set forth in newly added claim 8, which has a scope that includes other sputtering targets.

Furthermore, newly added claims 10 to 12 make disclosures that cite claim 8, and thus are also considered to go beyond the scope of the disclosures in the present application as originally filed for the same reasons as claim 8.

The "high-purity Ru thin film characterized in that the content of each alkali metal element such as Na and/or K is 10 ppm by weight or less and the content of Al is in a range of 5 to 50 ppm by weight," which is set forth in newly added claim 13, goes beyond the scope of the disclosures in the present application as originally filed.

As originally filed, the present application only claims thin films obtained by means of a sputtering technique that involves one of the sputtering targets set

## Supplemental Box

forth in claims 1 to 5, which are obtained by sintering a high-purity Ru powder, and does not claim the invention set forth in newly added claim 13, which has a scope that includes other thin films.

Furthermore, newly added claims 14 to 17 make disclosures that cite claim 13, and thus are also considered to go beyond the scope of the disclosures in the present application as originally filed for the same reasons as claim 13.